Problem Solving 08: Translation and Rotation

8.01
W11D3

Today's Reading Assignment:
MIT 8.01 Course Notes
Chapter 20 Rigid Body: Translation and Rotational Motion Kinematics for Fixed Axis Rotation
Sections 20.1-20.5
Chapter 21 Rigid Body Dynamics: Rotation and Translation about a Fixed Axis,
Sections 21.1-21.5

Announcements

Sunday Tutoring in 26-152 from 1-5 pm

Problem Set 9 due Nov 19 Tuesday at 9 pm in box outside 26-152

Math Review Nov 19 Tuesday at 9-10:30 pm in 26-152

Exam 3 Tuesday Nov 26 7:30-9:30 pm
Conflict Exam 3 Wednesday Nov 27 8-10 am, 10-12 noon

Nov 27 Drop Date

IC-W11D3-3 Group Problem 3 Sections L05-07

A bowling ball of mass m and radius R is initially thrown down an alley with an initial speed v_0 and backspin with angular speed ω_0, such that $v_0 > R\omega_0$. The moment of inertia of the ball about its center of mass is $I_{cm} = (2/5)mR^2$. Your goal is to determine the speed v_f of the bowling ball when it just starts to roll without slipping. What is the speed v_f of the bowling ball when it just starts to roll without slipping?